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補助科技部跨領域研究計畫之前置規劃案結案報告

不同物質使用程度的參與者對於沉浸式 VR 訓練模組之投入程度
與拒絕成癮物質的情緒調適與認知能力的關係：以腦波評量釐清
不同訊息類型與物質使用程度的關係

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中文摘要

長期濫用成癮物質會引起生理機制的改變，是屬於一種慢性、容易復發的腦神經疾病，影響範圍包含特定大腦區域的神經細胞在形態結構以及生物化學層面上產生的慢性改變。物質成癮患者通常伴隨著認知功能方面的缺陷，導致複雜的物質依賴病因。應當結合生物、心理、社會等多方面的處遇（treatment），採用綜合處遇的模式提供服務，才可能達到可預見性、可持續性的效果。本計畫擬利用虛擬實境（virtual reality, VR）技術特有的沉浸式體驗，以期能有效抗拒各種成癮物質輕度誘發的條件反射作用，緩解不同種類成癮物質使用者對成癮物質的心理渴求，以達到停止或減少使用成癮物質的目的。處遇方法為線索暴露療法（cue exposure therapy, CET），是一種使物質成癮者（如非法藥物、酒精、尼古丁等）反覆暴露於其上癮行為有關的物質刺激（線索）的治療方法。對這些線索的反應（主觀、生理和行為）通常被認為是一種制約反應，影響個人使用成癮物質的可能性。反覆暴露於這些線索，而不提供成癮物質應可促進制約反應的消失，並透過訓練增強其認知功能與情緒狀態，從而消除了繼續使用藥物的初步動機，並降低再次使用的可能性。

目前國內吸毒新生人口主要是青少年族群，因此子計畫一：校園春暉學生個案多為好奇誤用的三、四級毒品使用居多，代表新生人口，開發大腦訓練模組與 VR 教育模組，讓剛使用毒品的青少年可以停止使用毒品；子計畫二：電子煙已經逐漸成為毒品的載具且難以查緝，故結合社群媒體文字探勘、VR、qEEG 評估等技術，開發因應社媒行銷的 VR 教育訓練模組，以完整的 qEEG 評估訓練成效。子計畫三：針對毒品危害防制中心的再犯個案，可能多為一、二級毒品的使用者，藉由腦波評量協助使用者進行生理調節，以期遏止再犯；子計畫四：以腦波評量釐清不同訊息類型與物質使用程度的關係，協助三個子計畫的研究對象開發腦功能的個別化訓練方案，一旦能夠開發出具有實證基礎的 VR 訓練方案，將是成癮物質防治的新里程碑。

關鍵字：虛擬實境、線索暴露療法、定量腦波圖

Abstract

The habitual taking of addictive substances can cause physiological changes. Substance addiction is a neurological disorder that has often been characterized as a chronically relapsing condition, affecting the morphological and biochemical chronic changes of neurons in specific brain regions. People addicted to a substance are often accompanied by deficits in cognitive function, making the cause of substance dependence remain a mystery. Therefore, in order to so as to achieve predictable and sustainable results, it's necessary to combine the treatments of biological, psychological, social and the others, and to adopt a comprehensive treatment model to provide services. This project intends to use the unique immersive experience of Virtual Reality in the hope that addicts can effectively resist various addictive substances that mildly induce conditioned reflex, relieving their cravings of different types of addictive substances. The goal is to help addicts stop or manage cravings for substance abuse. The treatment method is cue exposure therapy (CET) in which the addict is repeatedly exposed to the substance (illegal drugs 、 alcohol 、 nicotine) he is addicted to. Repeated exposure to these cues without the provision of an addictive substance should promote the loss of conditioned responses and enhance cognitive function and emotional state through training, thereby eliminating initial motivation to continue drug use and reducing the likelihood of re-use.

New drug users are mainly young people. Therefore, sub-study 1: most of the student cases on campus are misusers and curious about the of grade III and IV drugs. On behalf of the newly initiators, we will develop a brain training modules and VR education modules so that young people who have just used drugs can stop using drugs; Sub-study 2: E-cigarettes have gradually become a device for illicit drugs and are difficult to detect. Therefore, combined with three technologies of social media text exploration, VR, qEEG evaluation, we will develop VR education and training modules for counteracting social media marketing. A comprehensive qEEG will apply to evaluate the training effectiveness. Sub-study 3: for the recidivism cases from the center of drug harm prevention and control, most of them may be grade I and II drug users. Brain wave assessment is used to assist users in physiological regulation in order to curb recidivism; Sub-study 4: clarify the relationship between different information types and substance use degree by brain wave assessment, and assist the research participants of the three sub-studies to develop individualized training programs for brain function. Once VR training programs with empirical basis can be established, it will be a new milestone in the prevention and treatment of addictive substances.

Keywords: virtual reality (VR), cue exposure therapy, (CET), quantitative Electroencephalogram (qEEG)